NEW SET OF CLAIMS

1. Process to separate propene from gaseous fluid catalytic cracking products by performing the following steps:

a) separating a feed mixture comprising the gaseous products, propene and other saturated and unsaturated hydrocarbons ranging from methane to hydrocarbons having a boiling point of 250 °C as obtained in a fluid catalytic cracking process into a hydrocarbon-rich liquid fraction and a hydrogen containing gaseous fraction,

b) separating the hydrogen containing gaseous fraction into a hydrogen-rich gaseous fraction and a hydrocarbon-rich gaseous fraction by means of a membrane separation at a temperature of between 50 and 100 °C,

c) supplying the hydrocarbon-rich gaseous fraction obtained in step (b) to an absorber section, wherein to the top or discharge end of the absorber section a liquid hydrocarbon mixture is supplied to, which hydrocarbon mixture is poor in propene, and obtaining in said absorber section a lower boiling fraction rich in gaseous products having a boiling point of ethane or below and supplying the hydrocarbon-rich liquid fraction obtained in step (a) to a stripper section and obtaining in said stripper section a higher boiling fraction comprising propene and hydrocarbons having a boiling point higher than ethane.

2. Process according to claim 1, wherein the gaseous fraction obtained in the stripping section is supplied directly to the absorber section.

3. Process according to any one of claims 1-2, wherein the higher boiling liquid fraction obtained in the absorber section is supplied to step (a).

4. Process according to any one of claims 1-3, wherein the stripping section and the absorber section are combined in one distillation column.

5. Process according to claim 4, wherein the hydrocarbon rich liquid fraction obtained in step (a) is fed to a position in the distillation column above the feed inlet of the hydrocarbon rich gaseous fraction obtained in step (b).

6. Process according to any one of claims 1-5, wherein the hydrogen separation selectivity of the membrane separation in step (b) is greater than 20, wherein the hydrogen separation selectivity is defined as the permeability ratio of hydrogen over methane.

7. Process according to any one of claims 1-6, wherein the methane separation selectivity of the membrane separation in step (b) is greater than 5, wherein the methane separation selectivity is defined as the permeability ratio of methane over propane.

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